

## SEIXOSO-VIEIROS RARE ELEMENT PEGMATITE FIELD: DATING THE MINERALIZING EVENTS

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The Seixoso-Vieiros Rare Element Pegmatite Field is included in “Galicia Trás os Montes geotectonic zone” in northern Portugal defined by Farias et al (1987). The Seixoso-Vieiros pegmatite field is known for containing numerous granitic pegmatite-aplite veins (Seixoso and Vieiros pegmatites). The area is bounded at the north by the Variscan Celorico de Basto granite massif. On the SE it is bounded by the syn- tectonic Felgueiras granodiorite. Several pegmatites outcrop within cordierite-andalusite isograde Silurian schists. The field is also known for mining of cassiterite and columbite-tantalite in the last century (Maijer, 1965).

In the Seixoso area, an unusual heterogeneous granitic intrusion outcrops as two main apices in Seixoso and Outeiro as granites cupolas (Lima *et al.*, 2009). These rocks show a typical granitic mineral assemblage and exhibit a textural variation from biotite-bearing, at depth, to two mica, or muscovite tourmaline, near the apex roof (Helal *et al.*, 1993).

The Seixoso granite is described as a fine to medium-grain leucogranite, with biotite and muscovite, strongly altered with albitization and greisenization close to the contact zones. The Outeiro granite is layered and shows pegmatitic segregations. In the latter, Li-bearing minerals, such as petalite and spodumene, have been observed. In addition, minerals from the amblygonite-montebbrasite series have also been noted within the granitic mineral assemblage (Lima *et al.*, 2009). Other notable accessory minerals include: beryl, chrysoberyl, tourmaline and sekaninaite, and others.

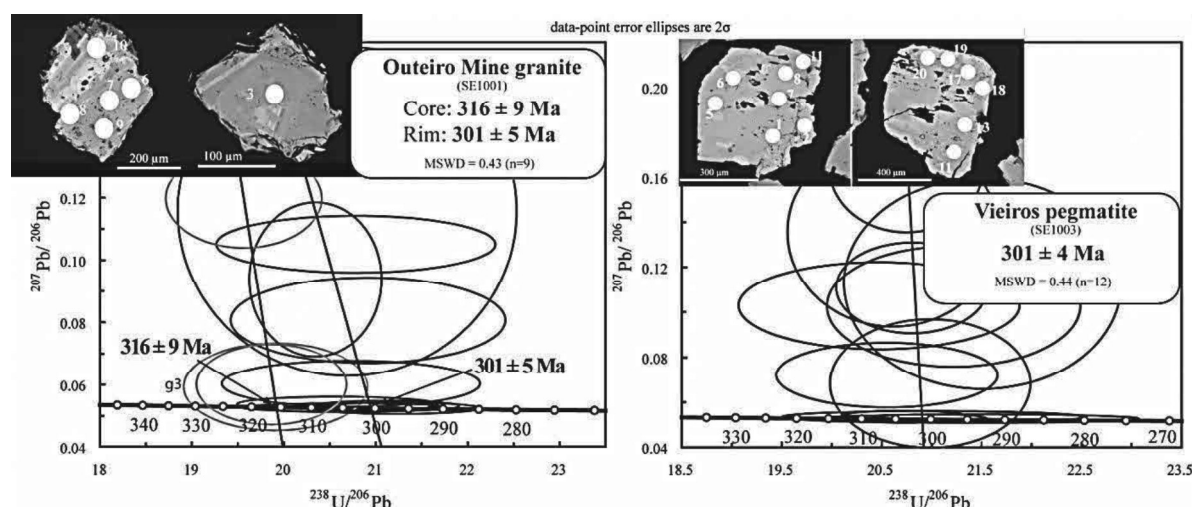
In the Vieiros area, the granitic aplite-pegmatite veins mainly cross-cut schists of Silurian age within the andalusite isograde. A dozen N-S to NE-SW-trending Sn-bearing granitic aplite-pegmatite veins outcrop in the area. They present a rich mineralogy: quartz, K-feldspar, albite, muscovite, petalite, spodumene, amblygonite-montebbrasite, cassiterite,

columbite-tantalite, tourmaline, and many different sulfides. An albite type pegmatite is exposed in the Vieiros mine and measures 300 meters in length, an average 5 meters in width, and is subvertical, striking E-W, and dips N25°.

During this study (Melleton *et al.*, submitted), columbite and tantalite grains were dated by the U-Pb method, using the LA-SF-ICP-MS technique, from the Outeiro mine granite and the Vieiros mine albite type pegmatite. Results of dating (figure 1) from the Vieiros pegmatite yield an age of emplacement of  $301 \pm 4$  Ma (12 analyses). Ages obtained from the Outeiro granite yield  $301 \pm 5$  Ma (9 analyses) and  $316 \pm 9$  Ma (from two analyses located in cores of two different single grains, and with significantly low concentrations of U). This latter age is interpreted as age of crystallization of the Outeiro granite, and the younger age corresponds to post-emplacement disturbance related to the Vieiros-Seixoso pegmatite emplacement, located in the surrounding area.

Located hundred meters from the Outeiro mine granite, the Seixoso pegmatite shows similar structural and mineralogical features as the Vieiros pegmatite. Therefore, emplacement of these pegmatites and associated fluids could have been the cause of the Outeiro Mine columbite-tantalite rim age. The Celorico de Basto late-D3 granite in the north and the Felgueiras syn-D3 granodiorite in the south had not been directly dated. However, Dias *et al.* (1998) dated equivalent granitoids and obtained ages around 305-308 Ma for the late D3 granite and early ages ranging between 310 and 320 Ma for the syn-D3 granites. Thus, there is not a temporal link between the Vieiros pegmatite emplacement and the surrounding granites of this field.

New samples are being collected in order to understand the different mineralizing events and relationships between other pegmatites and surrounding granitic cupolas of the studied area.



**Fig. 1:** Results of U-Pb dating on tantalite from the Outeiro Mine granite and the Vieiros pegmatite

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